I CLAIM

1. An automated mechanical device to separate the epithelial layer of a cornea from the cornea, the device comprising:

a separator, where said device can preserve the separated epithelial layer as a disk without rupturing said disk and without substantial epithelial cell loss.

2. The device as claimed in claim 1 wherein the device further comprises at least one of:

a ring seating on the eye with its plane parallel to a limbus, having an internal diameter ranging from about 10 to about 12 mm and external diameter from about 13 to about 16 mm including a groove, where said groove is wider than the internal diameter;

a separator support that fits in said groove to carry the separator on a determined travel; and

an oscillation device that provides motion and vibration to the separator.

3. The device as claimed in claim 1 where said separator is not sharp enough to excise corneal tissue during operation.

4. The device as claimed in claim 2 where said separator is not sharp enough to excise corneal tissue during operation.

5. The device as claimed in claim 1 where a travel of the separator is controlled to produce an epithelial disk hinged to the border of separation.

6. The device as claimed in claim 2 where a travel of the separator is controlled to produce an epithelial disk hinged to the border of separation.

7. The device as claimed in claim 1 where the ring includes a circumferential groove on the side of the eye and suction is applied to the circumferential groove to ensure stable mounting of the ring.

8. The device as claimed in claim 2 where the ring includes a circumferential groove on the side contacting the eye and suction is applied to ensure stable mounting of the ring.

9. The device as claimed in claim 1 wherein the separator oscillates with frequency ranging from about 10Hz to about 10KHz.

10. The device as claimed in claim 9 where the separator oscillation is provided by electromagnetic forces on the separator.

11. The device as claimed in claim 9 where the separator oscillation is provided by piezoelectric forces on the separator.

12. The device as claimed in 9 where the separator oscillation is provided by external rotating or vibrating wires.

13. The device as claimed in claim 1 further including rotating gears where a motion of the separator support is provided by the rotating gears placed on the support, where rotation to the gears is provided by said oscillating device and said rotating gears are traveling on toothed rails that are parallel to the groove.

14. The device as claimed in claim 2 where the separator support freely slides in the groove.

15. The device as claimed in claim 14 where the separator support slides in the groove when driven by the oscillating device.

16. The device as claimed in claim 2 further including a rotating drum and where the separated epithelial disk is rolled on the drum.

17. The device as claimed in claim 16 wherein said drum includes a diameter ranging from about 3 to about 9 mm.

18. The device as claimed in claim 17 where said drum is coated with at least one of a hydrating substrate and a conditioning substrate.

19. The device as claimed in claim 18 where said at least one of the hydrating substrate and conditioning substrate is selected from the group consisting of HEMA contact lenses, tissue culture media, silicone and biocompatible hydrogels.

20. The device as claimed in claim 18 where said hydrating and conditioning substrate can be removed from the drum after the epithelial disk attaches on to the drum.

21. The device as claimed in claim 16 where said drum includes a hollow interior.

22. The device as claimed in claim 21 where a surface of the drum includes holes.

23. The device as claimed in claim 22 where said holes communicate with the hollow interior of the drum to connect to air suction through the hollow interior of said drum.